

EPA's Electric Power Data Tools

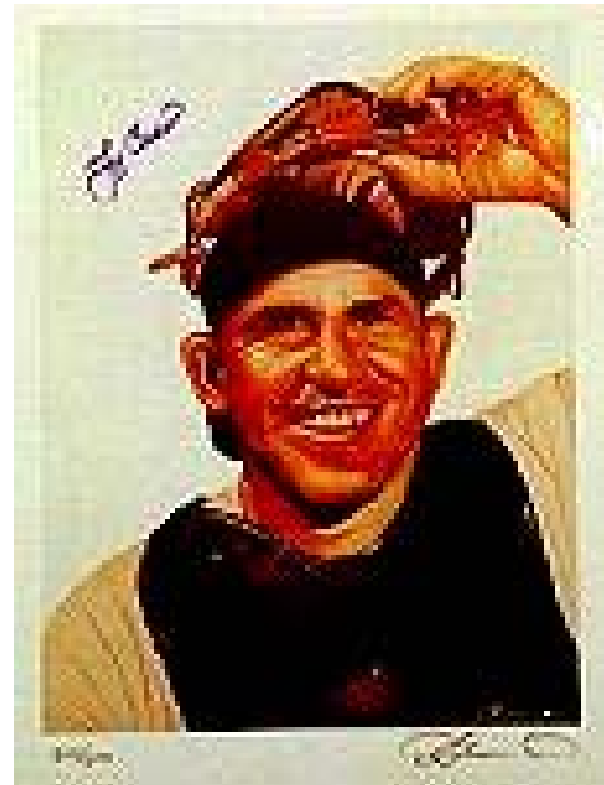
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November 22, 2002



Summary

- Electricity & air emissions
- The North American power grid
- EPA data tools

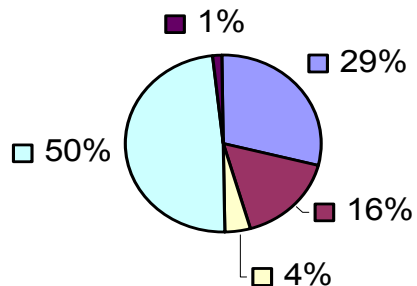
Source:
www.yogi-berra.com



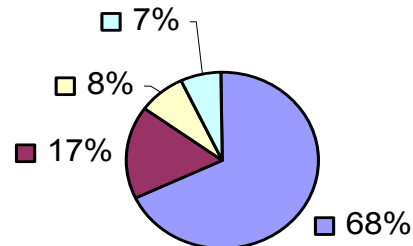
Major Air Emissions from Power Generation



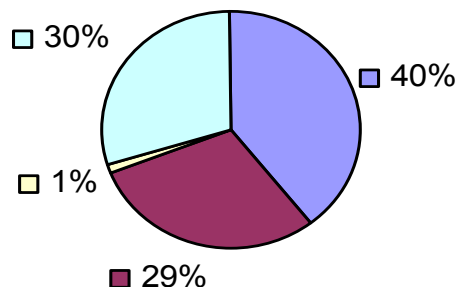
1997 NO_x Emissions



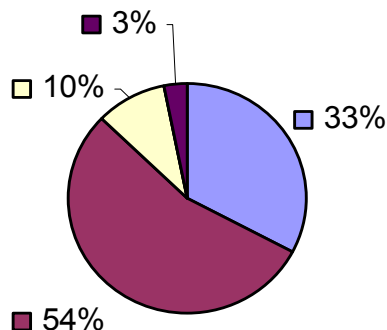
1997 SO₂ Emissions



1997 CO₂ Emissions

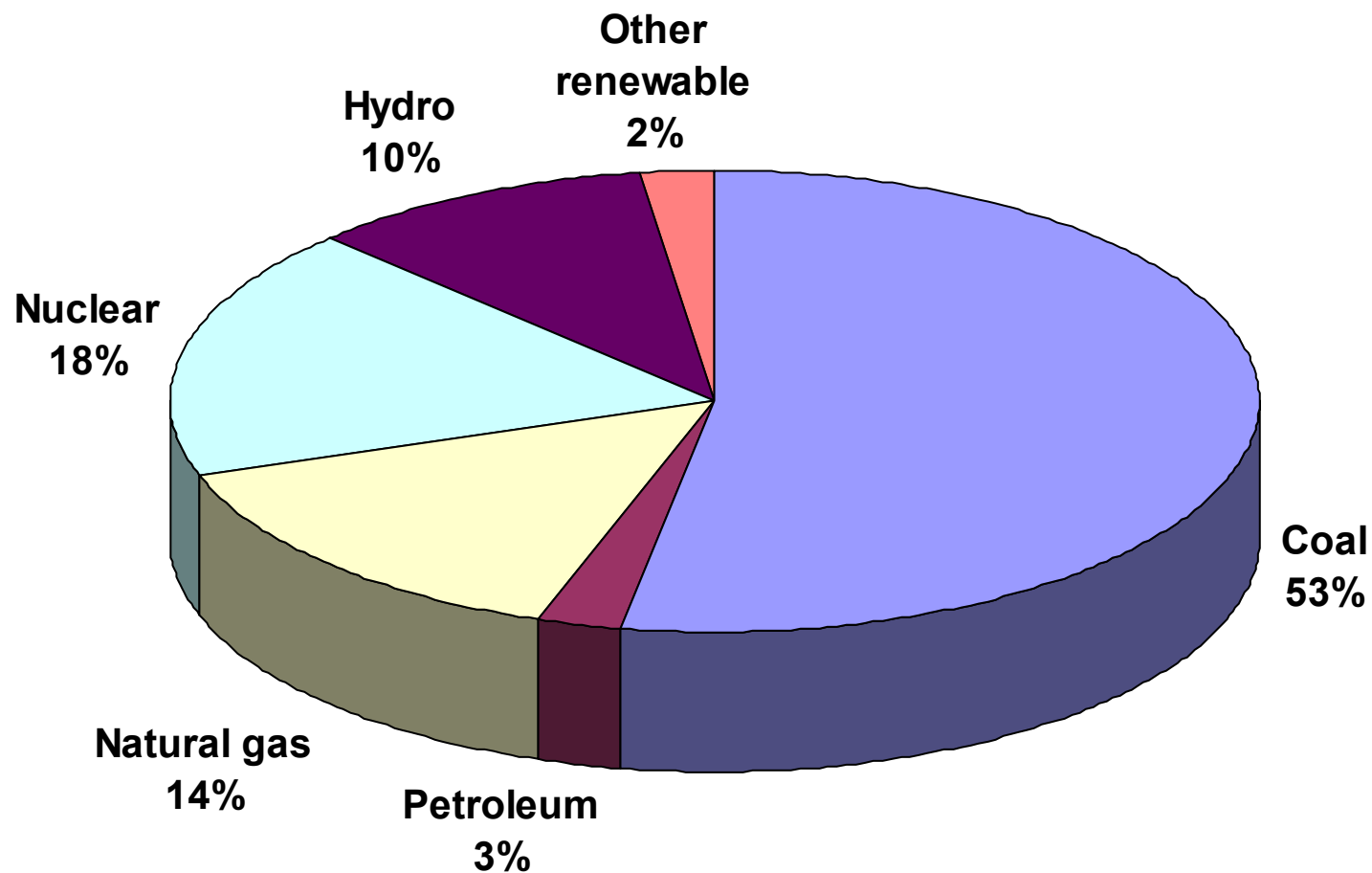


1995 Mercury Emissions

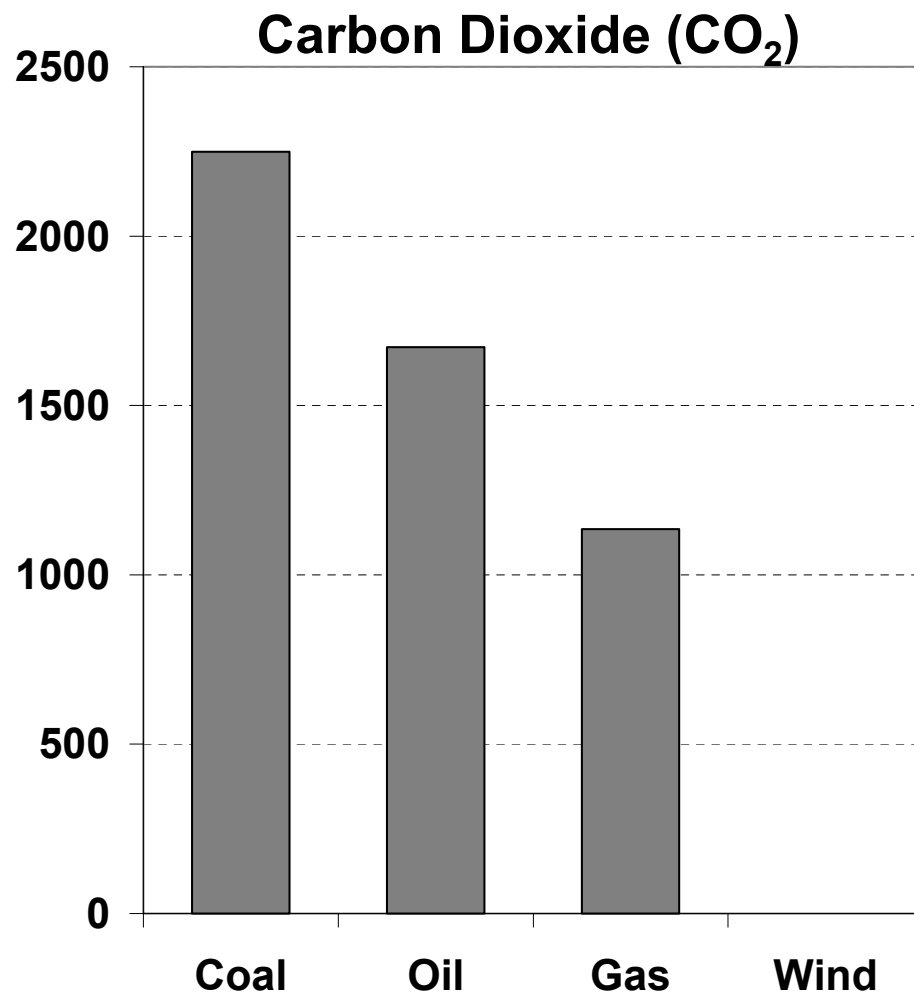
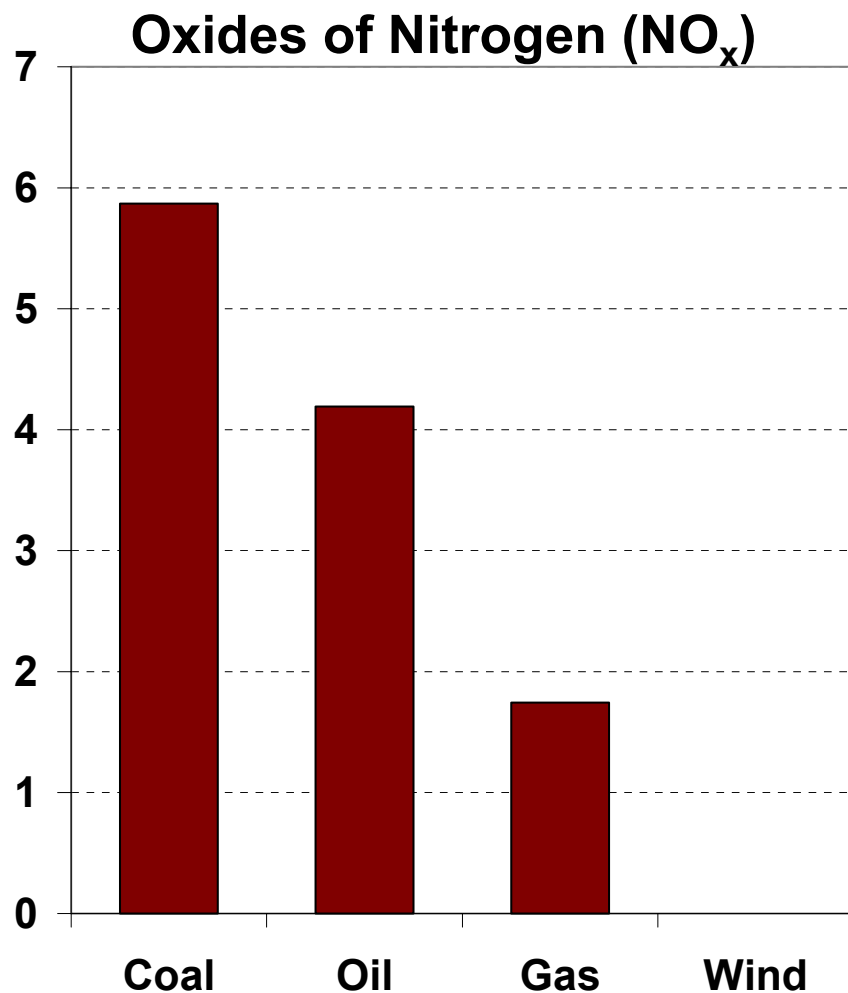


- Power Generation (Mercury is only electric utility)
- Other Stationary Combustion (includes industrial, commercial, residential)
- Industrial Processes (e.g. chemical, metal, petroleum)
- Transportation
- Miscellaneous

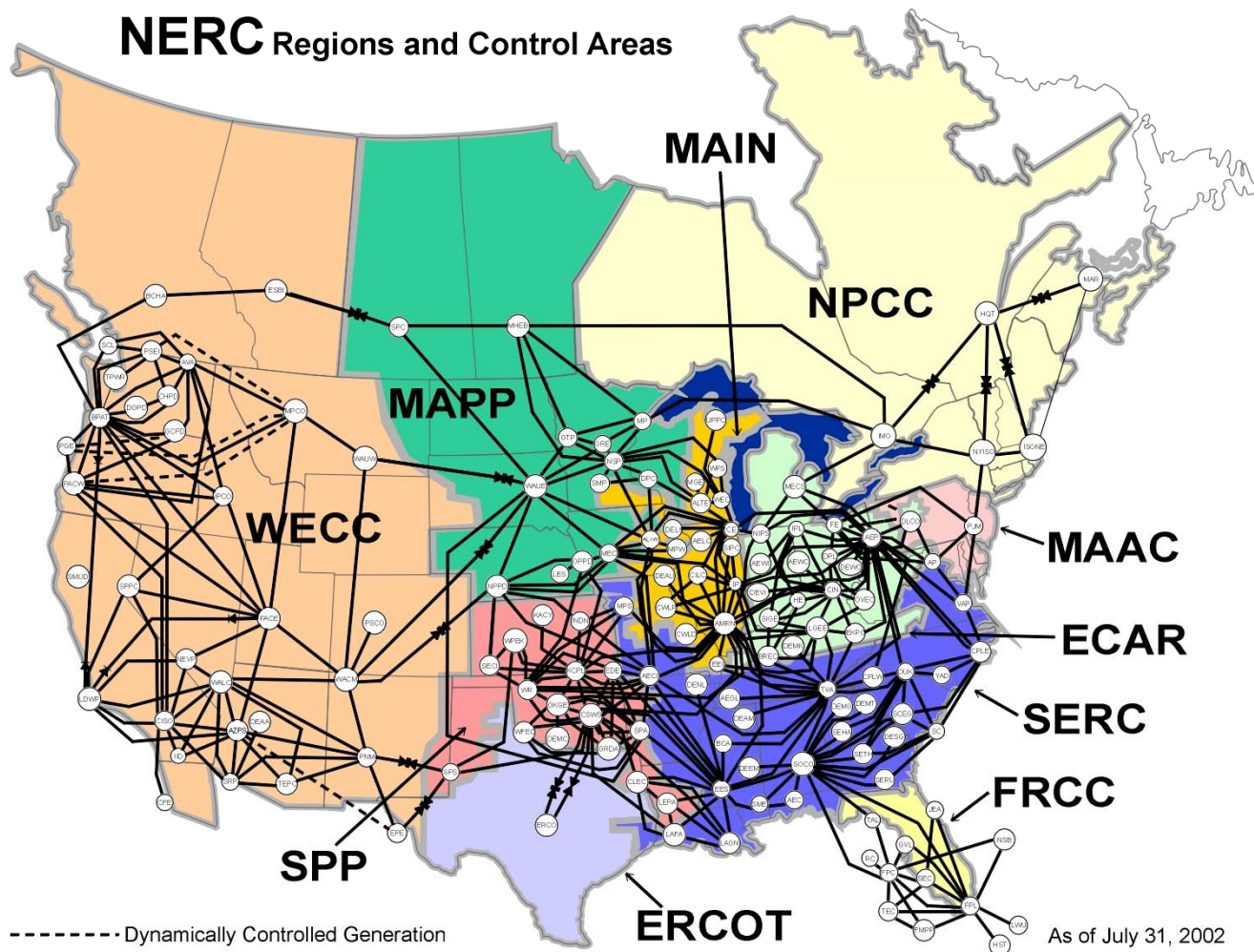
Power Industry Resource Mix (1997)*



Emission Rates: Fossil vs. Wind (lb/MWh), 1998

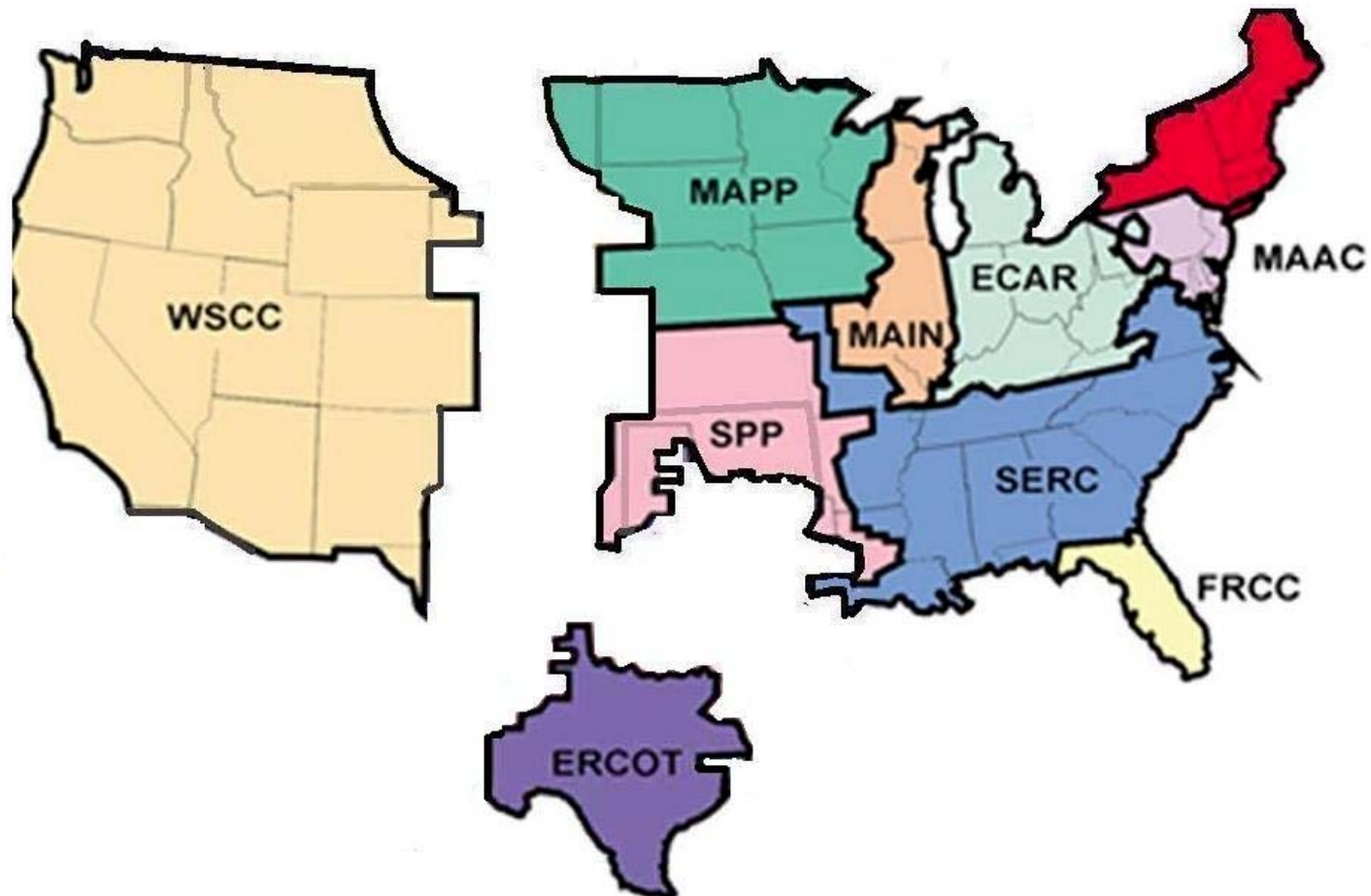


The Integrated North American Power Grid



***Power flows
don't follow
state lines!***

Three Distinct Grids



EPA Data Tools Support State & Local Programs



- **E-GRID**
- **Power Profiler**
- **Displaced emissions analysis (“ADER”)**

Searsburg VT (6 MW)
Photo source: NREL



E-GRID: EPA's Comprehensive Source of Electric Power Data



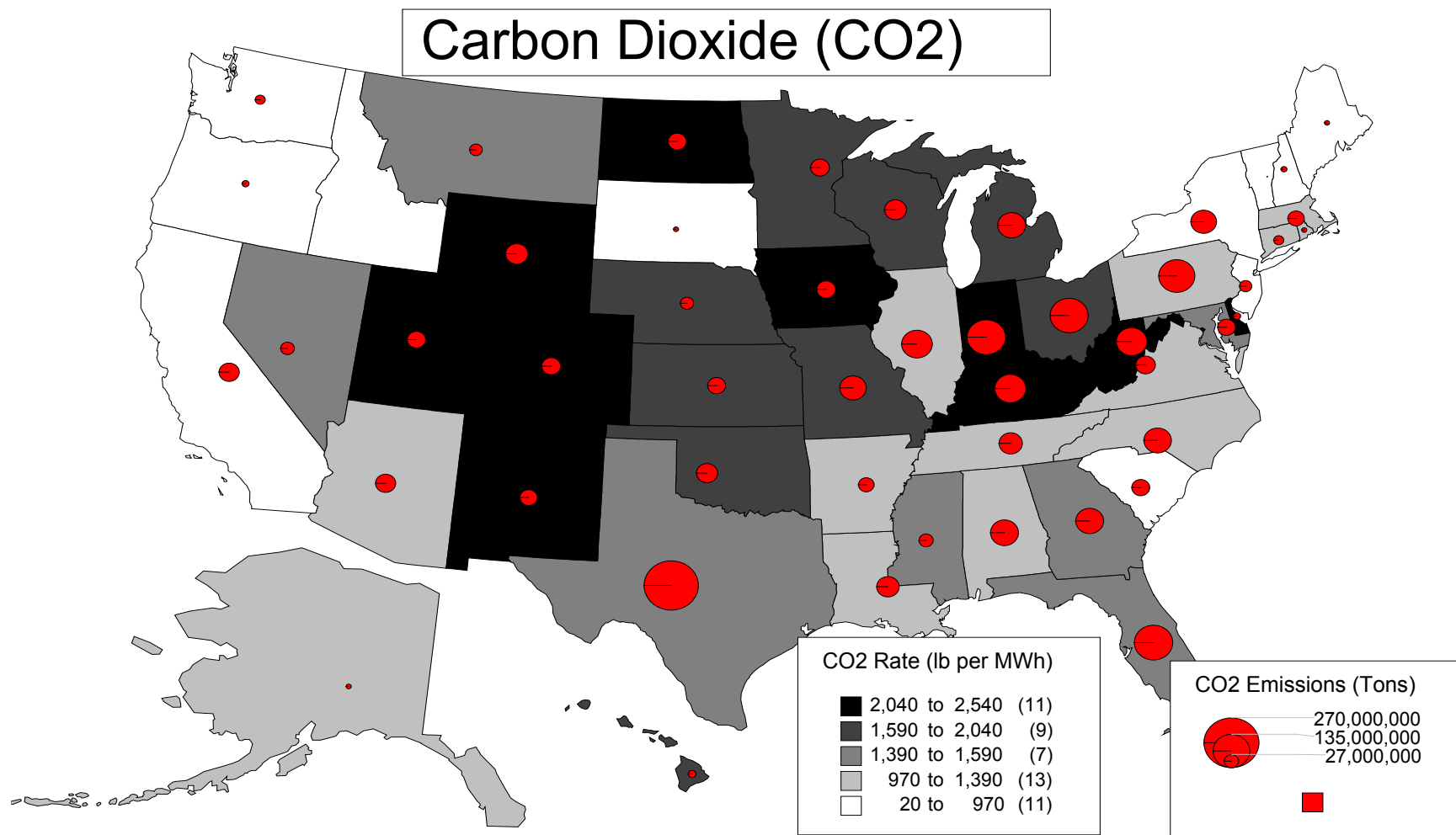
- **Emissions profile (NO_x , SO_2 , CO_2 , Hg)**
 - (short) tons
 - input rate (lb/mmBtu)
 - output rate (lb/MWh)
- **Generation resource mix**
 - percentage break-out by fuel type
- **Data aggregated to every level:**
 - unit, plant, company, state, grid region, U.S. total
- **Includes 4600+ US plants, 2200+ companies**
- **Integration of 23 federal data sources**



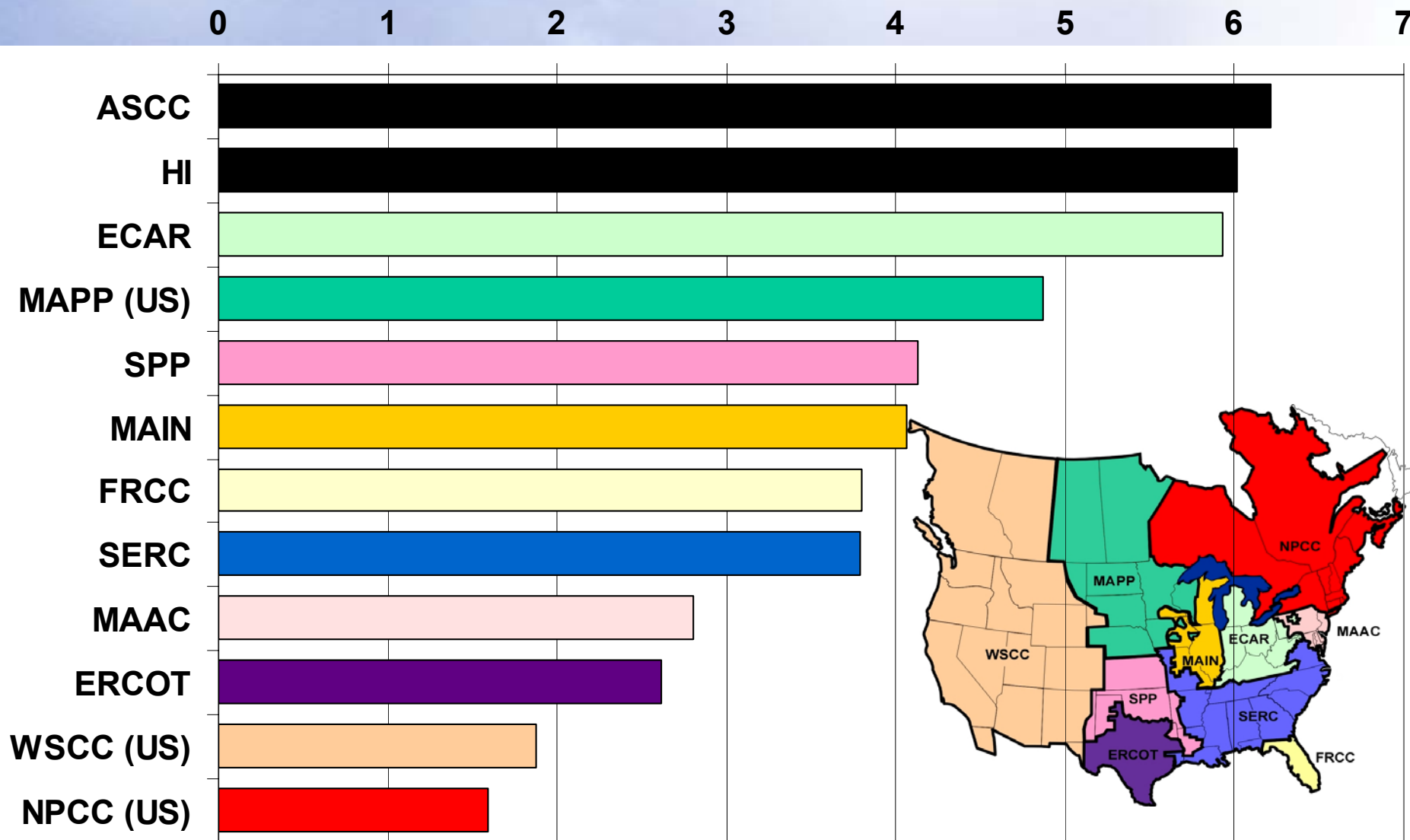
E-GRID Methodology

- **CEM-based emissions data overlaid on fuel-based estimates**
- **Mercury (Hg) data limited to 450 coal-fired plants**
- **CHP allocation formula:**
 - thermal output discounted by 50%
 - emissions, fuel consumption reported for electricity only
- **Biomass assigned zero CO₂ emissions**
- **Generation from MSW split:**
 - 70% biomass/ 30% fossil

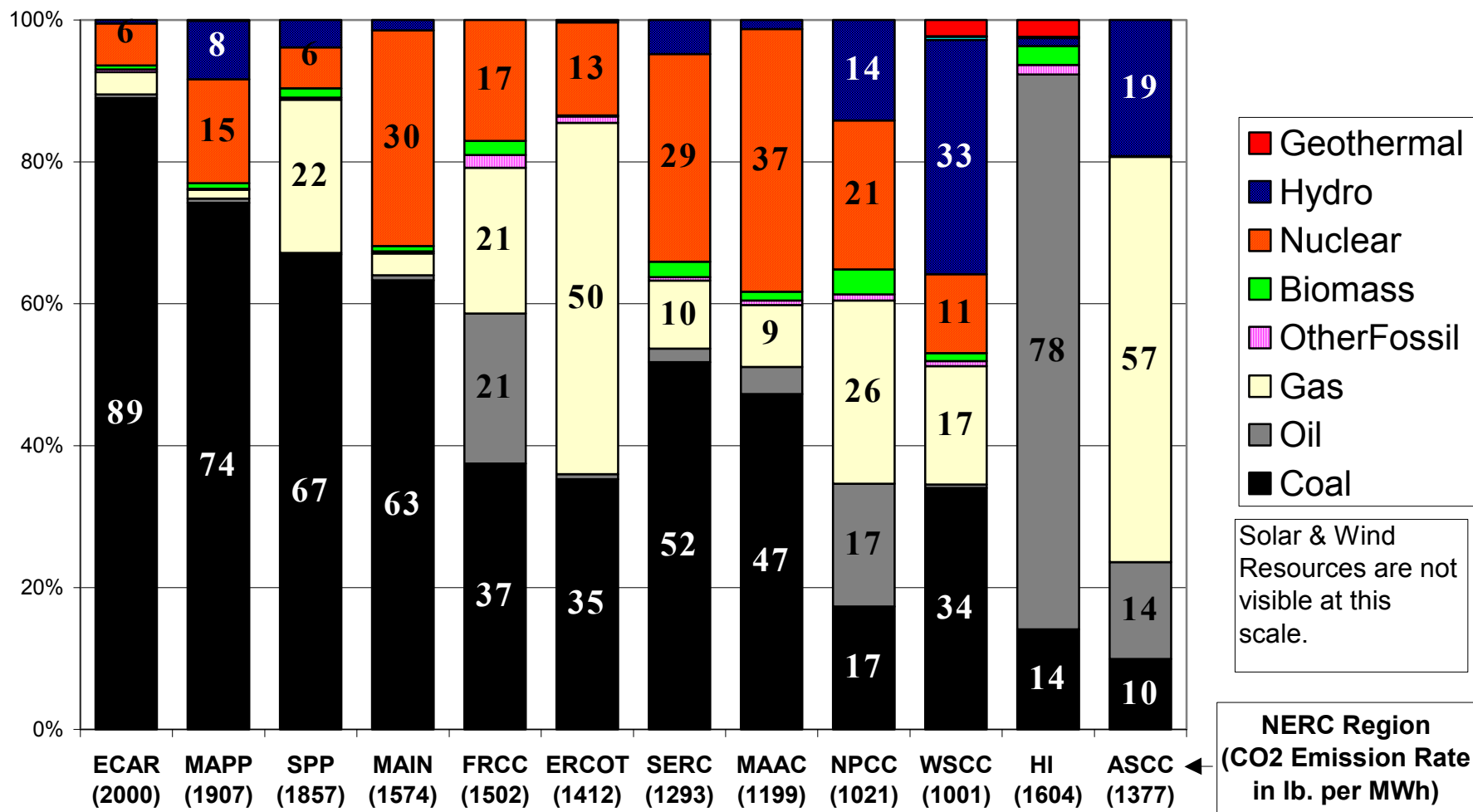
1998 CO₂ Emissions and Output Rates, by State



1998 Average Emission Rate of Nitrogen Oxides (pounds per MWh)



E-GRID 1998 Resource Mix by NERC Region*



*U.S. portions only

Uses for E-GRID

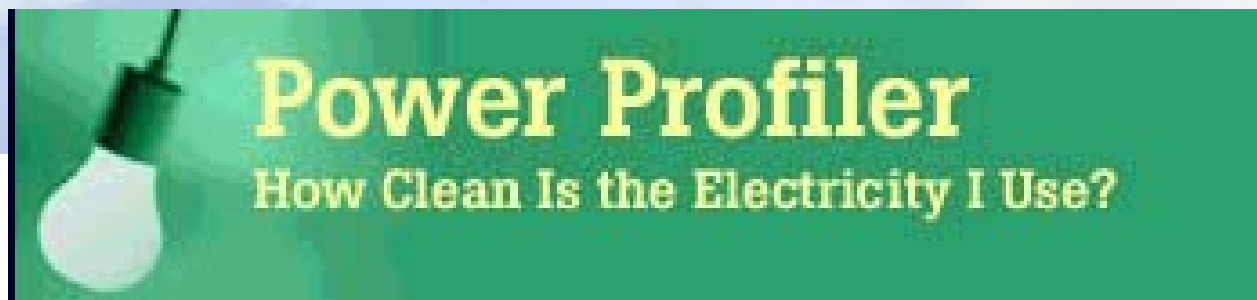
- **Consumer information disclosure/ "green" power**
- **Development of inventories, output-based standards**
- **Implementation of renewable portfolio standards**
- **Analysis of changing power markets**
- **Analysis of cap & trade mechanisms**
- **Public awareness of electric power emissions**

Accessing E-GRID Data

- **Two ways to view E-GRID data:**
 - user-friendly data browser (install on PC)
 - 35 spreadsheets in Excel workbook; ~1500 variables
- **Forthcoming E-GRID2002 edition featuring 2000 data expected late December 2002**
 - download from EPA Website:
www.epa.gov/airmarkets/egrid/
- **On-line access to E-GRID data expected early 2003**

Questions/comments?:

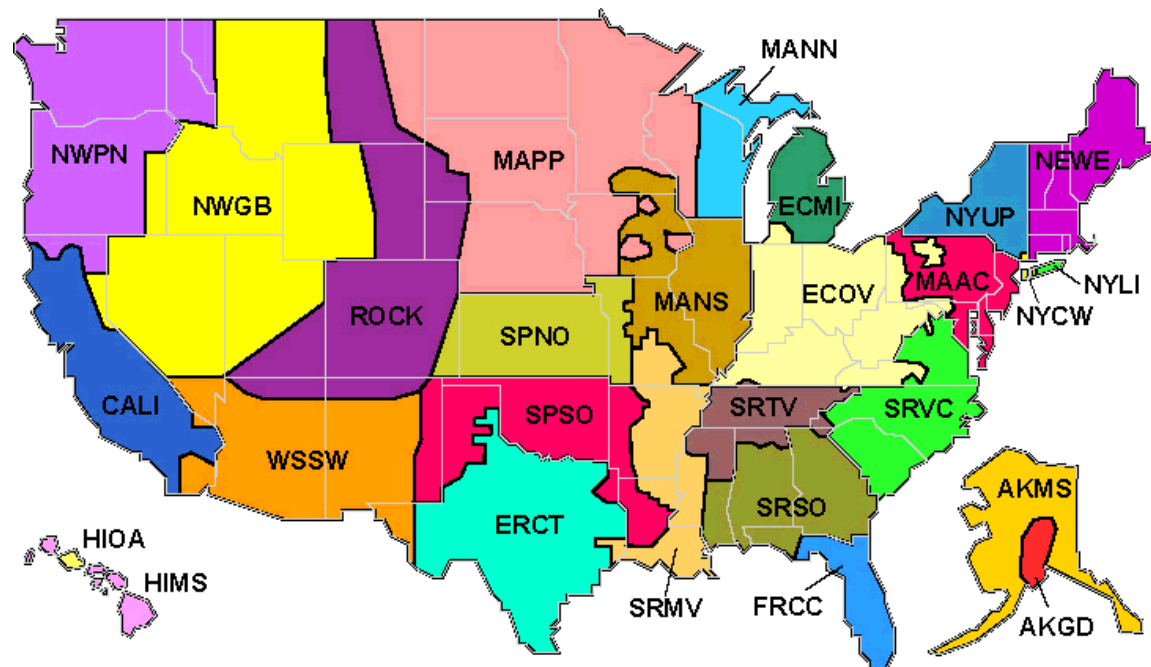
comments.egrid@epa.gov



- **Web-based calculator for businesses, individuals**
- **Calculates consumer's emissions and fuel mix**
 - compares to national average
- **Provides info on energy alternatives**
- **User provides:**
 - zip code
 - distribution utility (from pull-down menu)
 - monthly electricity usage

Power Profiler (cont'd)

- **Data based on E-GRID data for 27 grid “subregions”:**
- **Expected early 2003**



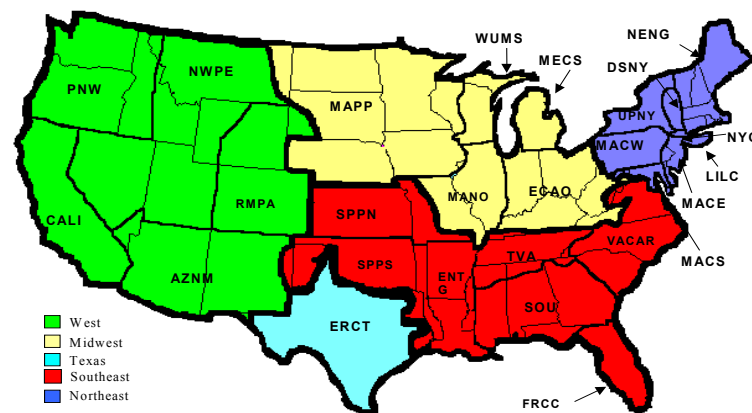
Access via www.epa.gov/cleanenergy

Forthcoming:



Average Displaced Emission Rates (ADER)

- Estimates emissions displaced by efficiency, clean energy technologies
 - CO₂, NO_x, SO₂, Hg
 - region-specific, for 5 U.S. regions
 - time frames: 2005, 2010, 2015, 2020
 - technology-specific estimates
- ADER values generally below historic system averages
- Preliminary results expected early 2003



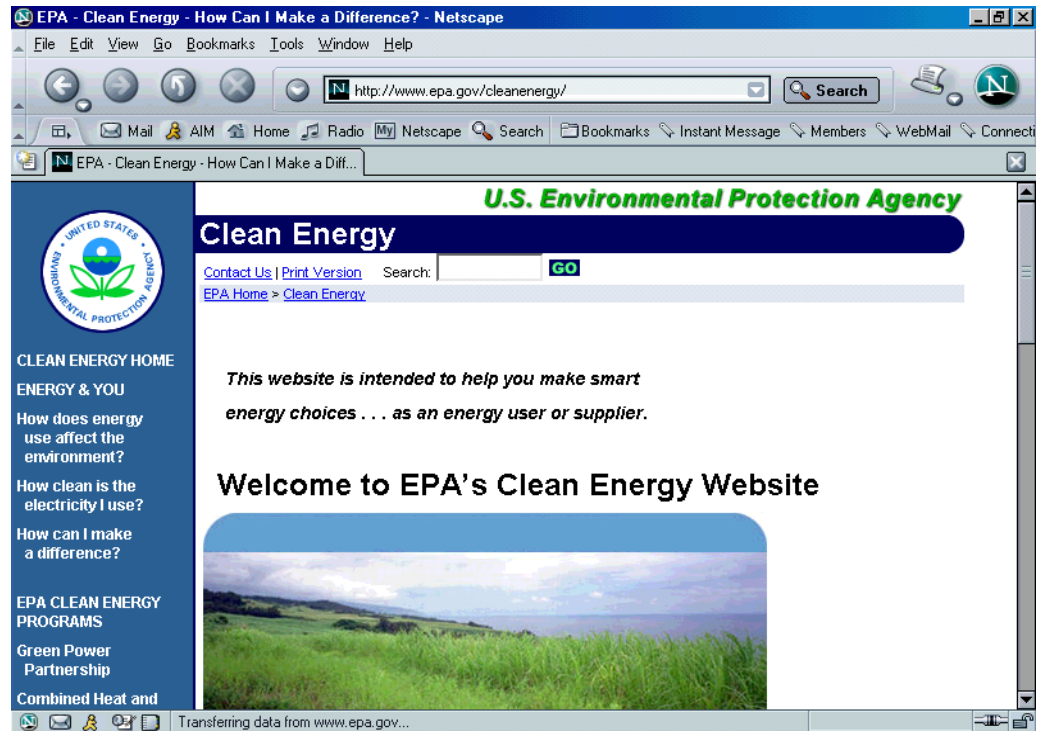
ADER Technologies

- **Residential energy efficiency**
 - weatherization
 - heating
 - new homes (overall)
 - programmable thermostat
 - air conditioning
- **Commercial energy efficiency**
 - tune-up
 - plant
 - lighting
 - fans & motors
 - equipment
 - overall
- **Clean energy supply, e.g.:**
 - wind
 - PV
 - other
- **National (uniform change to load shape)**

EPA's New Clean Energy Website



- Energy use & environment
- How clean is my electricity?
- How can I make a difference?
- Emissions data
- Green Power Partnership
- CHP Partnership



www.epa.gov/cleanenergy